# ENVIRONMENTAL REPORT 2015

## DIGEST VERSION

For the year ended February 28, 2015

STAR MICRONICS CO., LTD.

# FOREWORD

## Environmental Protection Activities

In recent years, concern for the global environment has been growing throughout the world. It is said that international society must cooperate and act based on scientific knowledge in order to take measures against global warming. Japan has set the target of reducing greenhouse gas emissions by 26% by 2030.

Amidst such conditions, environmental activities are an increasingly important part of corporate activities. Specific examples include reduction of greenhouse gas emissions, implementation of energy-saving measures, and response to stricter regulations for environmental conservation.

As a corporation which is expanding globally, our Company is implementing CSR activities in order to fulfill the trust and expectation of all stakeholders. We recognize environmental activities as an especially vital part of CSR activities and strive to create environmentally-friendly products.

Our Company is taking a wide range of action to realize a sustainable and recycling-based society. For example, we installed solar power facilities in December 2014 and have taken measures to reduce greenhouse gas emissions.

Moving forward, we shall continue to value CSR activities with an environmental focus. We look forward to your continued understanding and support.

June 2015
HAJIME SATO
President and CEO

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Range Covered:
Domestic/ Company offices (total of 4 locations),Subsidiaries (total of 2 companies)
Production Subcontracting Company(1 company), Sales agents (2 companies),Separate Company(1 company)

Overseas/ Subsidiaries (3 key production sites)
Coverage centered on Company activities, with some affiliates such as subsidiaries/sales agents also included.

Period:
· The year "2015" represents the period March 1, 2014 to February 28, 2015.

# ENVIRONMENTAL MANAGEMENT

## Progress toward ISO 14001 Certification

We have acquired ISO 14001 certification for all three of our domestic factories, all two domestic subsidiaries, one production subcontracting company, one separate company in the Ihara Factory, two domestic sales agents and three key production sites at our overseas subsidiaries.

In conjunction with our affiliates, we will continue activities to strengthen our overall promotion of environmental activities.

[DOMESTIC]

| Company Factories / Offices | | |
|---|---|---|
| Special Products | Ihara Factory | Acquired March 2001 |
| Precision Products | Fujimi Factory | Acquired February 2002 |
| Machine Tools | Kikugawa Factory | Acquired March 2002 |
| General Administration Headquarters<br>R & D Center | Head Office /<br>Quality Technical Center | Acquired September 2001<br>(Self-conformance declaration: September 2010) |

| Subsidiaries | | | |
|---|---|---|---|
| Star Metal Company | Manufacturing Division | Kikugawa Factory | Acquired April 2006 |
| | Plating Division | | Acquired March 2007 |
| Micro Sapporo Company | | | Acquired March 2007 |

| Production Subcontracting Company | | |
|---|---|---|
| BLUEL Co., Ltd. | Ihara Factory | Acquired October 2006 |

| Sales Agents | |
|---|---|
| C.M.I. Company | Acquired January 2006 |
| Move Company | Acquired January 2006 |

| Separate Company | | |
|---|---|---|
| Foster Electric Co., Ltd<br>Foster Micro Acoustic Company | Ihara Factory | Acquired March 2001 |

[OVERSEAS]

| Subsidiaries (Key Production Sites) | |
|---|---|
| Star Micronics Manufacturing Dalian Co., Ltd. (Dalian, China) | Acquired May 2002 |
| Shanghai S&E Precision Co., Ltd. (Shanghai, China) | Acquired February 2003 |
| Star Micronics Precision (Thailand) Co.,Ltd. (Ayutthaya, Thailand) | Acquired February 2009 |

[Self-Conformance Declaration]

At our Head Office and Quality Technical Center, we have instilled activities performed via through Environmental Management Systems and have eliminated almost all environmental load by transferring operations. Accordingly, we issued an ISO14001 self-conformance declaration in September 2010.

Since issuing the self-conformance declaration, we have promoted environmentally-friendly business activities based on environmental policy.

## Environmental Audits

### [ Internal Environmental Audits ]

Internal environmental audits are conducted regularly each year at domestic factories and affiliates to confirm that environmental management systems are adequate and effective, and that environmental management programs are appropriate and legally compliant.

We also conduct skills enhancement seminars for internal environmental auditors to improve the expertise of people conducting internal audits.

A comprehensive environmental audit report is created listing items that fall below the expected standards, and the report is submitted to management as data for use in compiling the end-of-year environmental review. Thus audits contribute to improvements in the following year.

Training for auditors

### [External Environmental Audits]

Domestic factories and affiliates that have acquired ISO14001 certification are subject to environmental audits (environmental management system inspection) by an external inspection authority. Certification maintenance inspections take place once a year, while renewal inspections are conducted every three years.

The results of these inspections are submitted to management as data for use in compiling the end-of-year environmental review, thereby contributing to improvements in the following year.

Conducting an environmental audit

## Environmental Training

Star Micronics and its domestic affiliates believe that to maintain, and further improve, the level of our environmental activities, we need to change the mindset of every single employee. We therefore offer training opportunities for all employees from new hires to management. Training comprises four core categories: general, rank-based, leader-oriented, and specialist. In 2015 (domestic), we conducted events such as an introductory environmental seminar, an environmental laws and ordinances seminar, an environmental impact evaluation seminar, a waste products seminar, a seminar on the cultivation of internal auditors, and an environmental law seminar.

[Environmental Training Structure]

| Training Category | Personnel Eligible | Internal/External Seminars Offered |
|---|---|---|
| General training | Regular employees | Introductory seminar, general seminar, waste products separation |
| Rank-based training | Managers | Managers' seminar |
| | Top management | Top management seminar |
| Leader-oriented training | Environmental leaders | Environmental manual seminar (including document management) |
| Specialist training | Environmental survey team | Environmental impact evaluation seminar |
| | Internal environmental auditors | Internal auditor development seminar (internal/external) * |
| | Personnel in charge of environmental law | Environmental law seminar* |
| | Public-sector environmental experts | Qualification seminar/test based on laws and regulations |
| | Personnel in charge of procurement | Green procurement seminar |
| | Personnel in charge of waste products | Waste products seminar |
| | Harmful substance handler | OJT by personnel with public-sector environmental qualifications |
| | Noise measurement personnel | OJT by certified internal environmental experts |

*For the certified internal environmental experts

[Public, Environmental Qualified Person Related to Environment]

| Name of Qualification | Number of Persons Qualified (Number of Persons Qualified in 2015) | Name of Qualification | Number of Persons Qualified (Number of Persons Qualified in 2015) |
|---|---|---|---|
| Safety manager | 5 (0) | Dangerous substance handler | 84 (2) |
| Public health manager | 16 (0) | Manager in charge of handling of toxic and harmful substances | 3 (0) |
| Pollution prevention manager | 7 (0) | Manager in charge of X-ray operations | 1 (0) |
| Manager in charge of industrial waste requiring special management | 16 (0) | Manager in charge of organic solvent operations | 35 (1) |
| Fire prevention manager | 13 (0) | Manager in charge of specific chemical substance operations | 7 (0) |
| Promoter of energy management and planning | 2 (0) | | |

Note: For the parent company only. Excludes domestic affiliates.

## Emergency Response

Every year, Star Micronics and its domestic affiliates plan and conduct emergency-related training of relevant parties and disaster prevention drills, as well as simulation-based drills for individuals and entire facilities based on manuals, which are evaluated as part of the process. These drills anticipate every conceivable accident or emergency (earthquake, typhoon, explosion, fire, blackout, chemicals leak, and airborne hazard, etc.).

### [Simulation-based Drills]

Oil leakage response drill

Response drill for light-oil leakage to a public waterway

### [Disaster Prevention Drills]

Firefighting drill

Evacuation drill

## Status of Legal Compliance

Star Micronics and its domestic affiliates have stipulated internal regulations for the application of environment-related laws, and compliance with these laws is evaluated in accordance with a list of specific items to be monitored and measured.

Legal compliance is confirmed by checking that results measured are in line with management figures, and the data is stored as an environmental record. When installing, introducing, changing, or disposing of facilities and equipment, we conduct an assessment of the facilities and equipment to evaluate legal compliance.

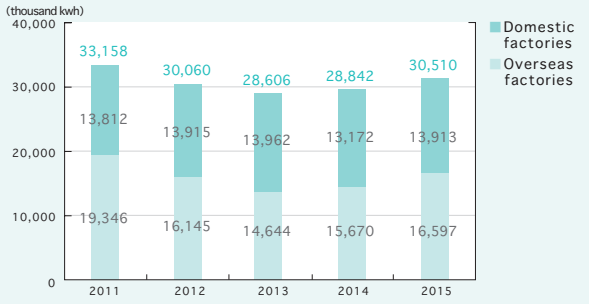
## ENVIRONMENTAL LOAD ASSOCIATED WITH BUSINESS ACTIVITIES

Our company uses a variety of resources and energy during the process of conducting business activities. This results in the emission of $CO_2$ and the generation of waste products. Our company assesses the environmental load associated with our activities and promotes activities to decrease environmental load by reducing the amount of energy consumed, reducing the amount of waste products generated and decreasing the amount of hazardous materials used.

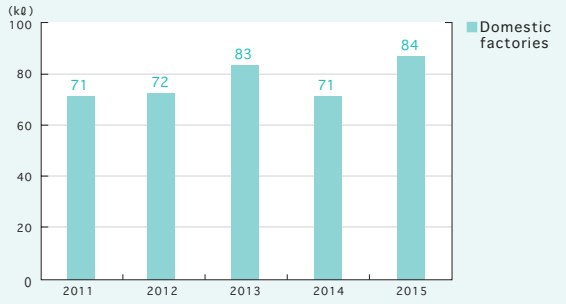
*Scope of Analysis: domestic (Star Micronics Co., Ltd. and affiliated domestic companies), overseas (Star Micronics Manufacturing Dalian Co., Ltd.; Shanghai S&E Precision Co., Ltd.; Star Micronics Precision (Thailand) Co., Ltd. (SMPT);Star Micronics Manufacturing (Thailand) Co., Ltd. (SMMT) :from 2014)

### Change in Input Amount (Major Items)

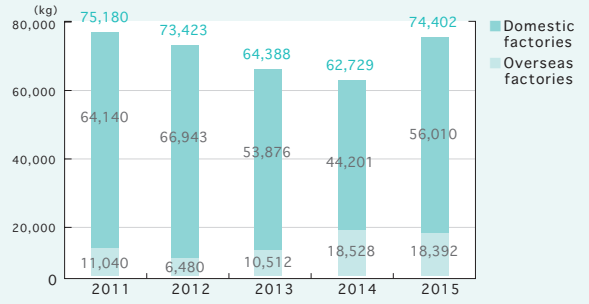
[Electricity Usage]




[Heavy Oil Usage]

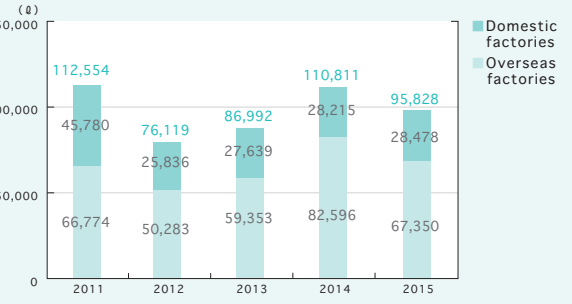



[LPG Usage]

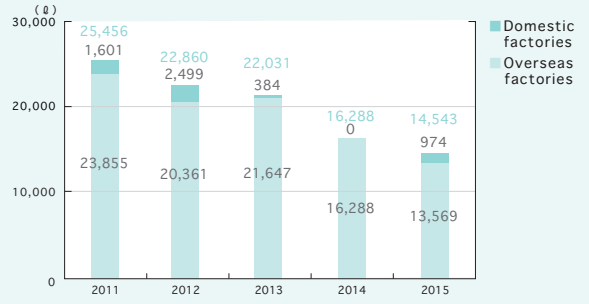



*The increase in 2011 is due to an increase in thermal processing during domestic painting processes caused by an increase in the production of machine tools in 2011.

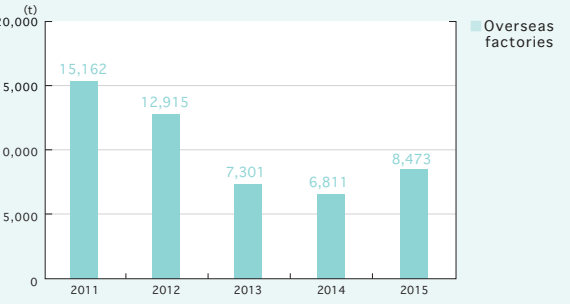
[Gasoline Usage]



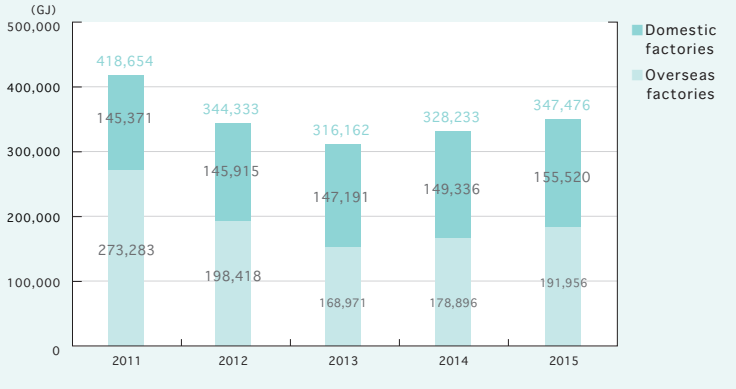

[Light Oil Usage]




[Amount of Steam Used]



[Total Amount of Energy Used]

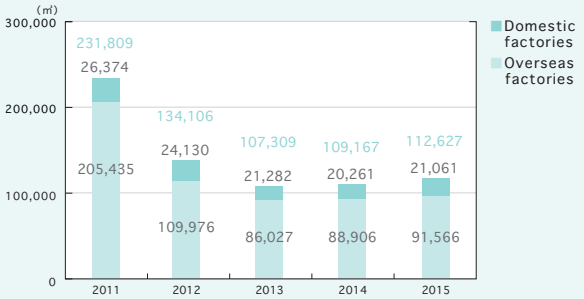



Note) Domestic conversion factors are used when calculating overseas energy.

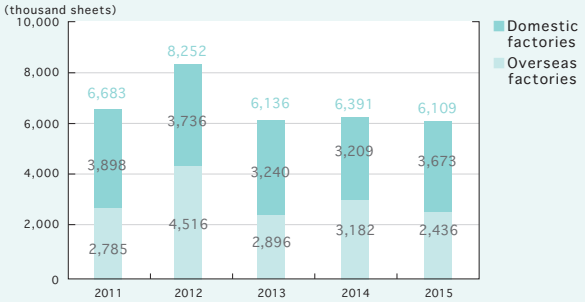
Although energy usage is increasing due to increased production, we have improved our energy consumption per unit, which is an index of energy usage efficiency.

*Energy consumption per unit: Calculated by dividing the amount of energy used by a value that is closely related to energy usage.

[Water Usage]

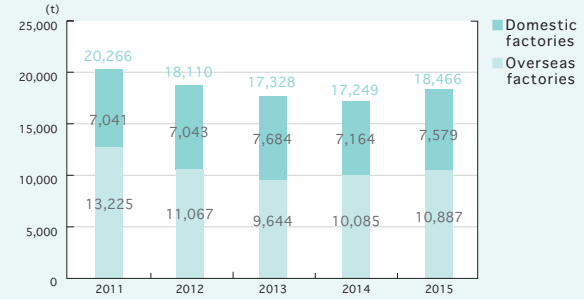



[Copy Paper Purchased]

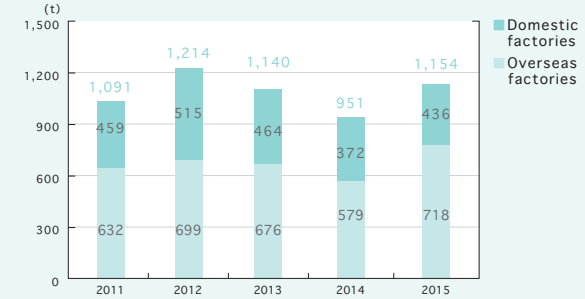



## Change in Discharge Amount (Major Items)

[$CO_2$ Emissions]




[Waste Generated]



## ENVIRONMENTAL ACCOUNTING

### [Environmental Protection Costs]

(thousands of yen)

| Category | | Initiatives | Domestic | | Overseas | |
|---|---|---|---|---|---|---|
| | | | Investment | Expenses | Investment | Expenses |
| Costs within Business Area | Pollution Prevention Cost | Prevention of air/water/ground contamination | 21,443 | 7,874 | 0 | 5,509 |
| | Environmental Preservation Cost | Energy conservation | 21,700 | 2,912 | 0 | 395 |
| | Resource Recycling Cost | Treatment/disposal of waste | 0 | 19,225 | 0 | 2,369 |
| Upstream/Downstream Cost | | Green procurement difference | 0 | 111 | 0 | 0 |
| Management Activity Cost | | EMS operation, education, on-site planting | 0 | 27,934 | 0 | 2,768 |
| Research & Development Cost | | R&D, WEEE/RoHS measures | 8,790 | 2,200 | 0 | 0 |
| Social Contribution Cost | | Donations, financial support | 107 | 216 | 0 | 0 |
| Environmental Damage Response Cost | | Repairs for ground/water contamination | 0 | 0 | 0 | 0 |
| Total | | | 52,040 | 60,472 | 0 | 11,041 |

Note: Excludes depreciation expense.

### [Financial Impact Resulting from Environmental Protection Measures]

(thousands of yen)

| Category | | Domestic | Overseas |
|---|---|---|---|
| Earnings | Gains from sales of marketable waste from business activities | 61,924 | 14,204 |
| Expense Reductions (Year on Year) | Total energy expense (electricity/heavy oil/LPG/gasoline/light oil) reductions | −45,806 | −20,903 |
| | Reductions in water/well water usage expense | −333 | −1,236 |
| | Reductions in copy paper purchase expense | −322 | 9 |
| | Reductions in waste disposal expense | 141 | 1,413 |
| | Others | 0 | 0 |
| Total | | 15,604 | −6,513 |

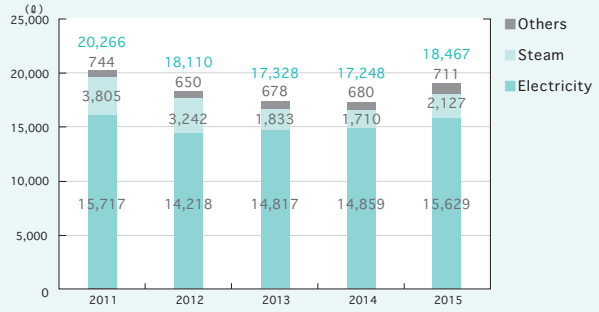
Note: In the expense reduction figures, a minus indicates that a reduction was not achieved and the expenses increased.

## ENERGY SAVING ACTIONS ~TO PREVENT GLOBAL WARMING~

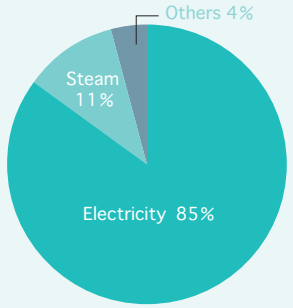
Our company is taking a variety of actions to reduce the amount of energy consumed and is working to reduce $CO_2$ emissions amount.

### [Changes in $CO_2$ Emissions Amount]

Changes in $CO_2$ Emissions by Category




Breakdown of $CO_2$ Emissions by Category (2015, domestic and overseas factoties)




### [Less Air Conditioning]

In 2015, we lengthened our company's Cool Biz Campaign in accordance with lengthening of the period at the Ministry of the Environment.

| Cool Biz Campaign | Warm Biz Campaign |
|---|---|
| 1. Period Conducted: May 7 to the end of October<br>2. Air conditioning temperature: Set to 28°C<br>(Although the campaign does not apply to manufacturing and reception areas, these are included as much as possible.)<br>3. Attire: No neckties or uniforms are worn | 1. Period Conducted: December 1 to the end of March<br>2. Heating temperature: Set to 22°C<br>3. Attire: Employees are encouraged to wear warm clothes |

Information is posted at the entrances to each office and visitors are urged to cooperate.

Cool Biz information board

Warm Biz information board

[Installation of solar power facilities]

As part of environmental conservation actions, we installed solar power facilities on roofs of Kikugawa Factory and the factory at Star Metal Company.
The two facilities provide a total output of 350 kilowatts. We forecast annual power generation of 450 thousand kilowatt-hours, an amount equivalent to the power consumed by about 125 average households.
All of the generated electricity is sold to Chubu Electric Power Co., Inc.

Solar Power Facility(Kikugawa Factory)

Solar Power Facility(Star Metal Company)

[Heat shielding using roof shades]

We have installed roof shades on our Kikugawa South Factory and Ihara Factory. These roof shades alleviate the drastic temperature increases associated with summer and reduce the amount of energy used for air conditioning. As a result, Ihara Factory has reduced energy consumption in summer by 28%.

Roof shades(Kikugawa South Factory)

Roof shades(Ihara Factory)

[Efficient and power-saving outside light]

We replaced mercury-vapor lamps in Micro Sapporo Company with metal halide lamps which feature high-brightness, power-saving and a long lifespan. Replacement with these new lamps realized a reduction in energy consumption of approximately 50%.
Also, at our Head Office we installed LED lighting which consumes one-tenth of the power of conventional mercury-vapor lamps.

Metal halide lamp(Micro Sapporo Company)

LED light

[The number of company cars owned]

In order to reduce the amount of $CO_2$ emissions by company cars, our company has implemented the use of lightweight cars and hybrid cars. We have also reduced the number of company cars used by our company.

(Number)

| Type of Car / Year | Ordinary Cars (Leased) | Ordinary Cars (Purchased) | Mini Cars (Leased) | Hybrid Cars (Leased) | Total |
|---|---|---|---|---|---|
| 2013 | 31 | 1 | 10 | 8 | 50 |
| 2014 | 30 | 1 | 10 | 9 | 50 |
| 2015 | 30 | 0 | 10 | 9 | 49 |

[No-Car Campaign]

Every year, our company holds a No-Car campaign for employees who commute by car or motorcycle to offices within Shizuoka City. We implemented a 2-week No-Car campaign in both spring and autumn of this year.

**Implementation Report**

| | |
|---|---|
| Enforcement period : | Monday, May 12 - Friday, May 23, 2014 |
| | Monday, October 20 - Friday, October 31,2014 |
| Participants : | 85 individuals |
| Eco-commute distance : | 3,516Km |
| $CO_2$ reduced : | 952Kg |
| | (calculated based on fuel consumption of 10 km/ ℓ) |

[Lights-Down Campaign]

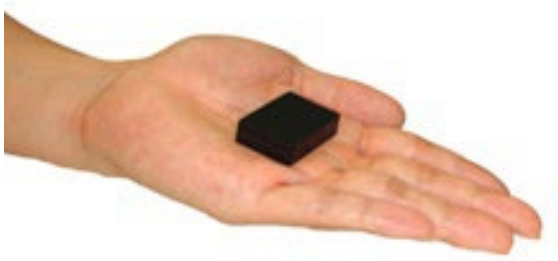
This year, our company once again participated in the Lights-Down Campaign held by the Ministry of the Environment. The rooftop neon logo signs at our Head Office, Ihara Factory and Fujimi Factory were turned off at 8:00 PM for the 4 days from July 4th (Friday) to July 7th (Monday) of 2014. As a result, the amount of power used during the 4 day period decreased by 1,116kwh.

[Vibration power generators (conservation of energy/resources)]

Our Company is developing a vibration power generator which utilizes energy harvesting technology. This technology is attracting increased attention in recent years.

Conventional technology did not use the vibration from machines, structures or the human body (in walking and running) as energy. However, the vibration power generator developed by our Company is capable of converting such vibration into energy. This enables efficient power usage for energy which was previously thrown away.

In the future, in addition to seeking further improvement in generation capability, we will promote the manufacturing of products which combine our Company's vibration power generator with various sensors and wireless communication sensors. This will enable monitoring of power sources in various fields including structures, moving bodies and machines. Our Company also seeks to contribute to conservation of resources by providing wireless and battery-less technology to the field of wireless sensor networks, an area for which significant future growth is expected.



Vibration power generator: EH12

## Response to the Revised Energy Conservation Act

[Energy conservation activities by the Energy Conservation Panel]

As a business which is subject to the revised Energy Conservation Act, our company must reduce our energy consumption rate every year in the mid- to long-term. In response to this law, our company has appointed an Energy Management Supervisor and an Energy Management Planner who fulfill a central role in energy conservation activities. We have also established an Energy Conservation Task Force and formulated Compliance Rules for Promoting Energy Conservation to serve as guidelines. Through such measures, we are actively working to conserve energy.

# LOWERING ENVIRONMENTAL CONTAMINATION RISK

## Managing Chemical Substances

Star Micronics and its domestic affiliates have created and implemented internal regulations for the management of harmful substances and dangerous materials handled by the Company in order to ensure proper and safe management of chemical substances. These internal regulations, based on the relevant laws and statutory regulations, are designed to ensure that the environment is taken into account in the purchasing, storage, use and disposal of such substances.

### [Response to PRTR Law]

In accordance with the PRTR (Pollutant Release and Transfer Register) Law, we have continued to submit notification regarding the emission and transfer volume for Class I Designated Chemical Substances. The annual handing volume of such substances has decreased greatly due to the use of powder paints which do not contain organic solvents (including substance subject to PRTR) and to a change to alternative materials. As a result, since 2010 there are no longer any offices or affiliated companies for which submission is required.

However, from the perspective of appropriate handling of chemical substances, we will continue to gather data on emission and transfer volume.

The emission/transfer amount of substances in 2015 was as follows:

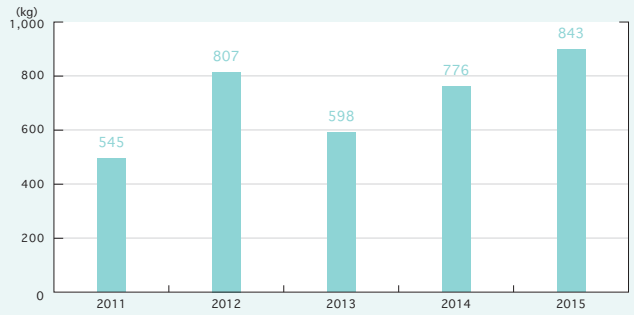
### [PRTR Reports for all Domestic Factories and Affiliates]

(Unit: kg/year)

| Year | Substance No. | Chemical Substance Name | Use | Emmissions Volume | | | Transfer Volume | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Air | Public Drainage Areas | Ground within Factory | Landfill within Factory | Washed into Sewage | Waste within Factory | |
| 2015 | 309 | Nickel Compound | Chroming | 0 | 0 | 0 | 0 | 2 | 118 | 120 |
| | 227 | Toluene | Coating | 465 | 0 | 0 | 0 | 0 | 226 | 691 |
| | 63 | Xylene | Coating | 9 | 0 | 0 | 0 | 0 | 19 | 28 |
| | 374 | Hydrogen fluoride and water-soluble salt | Polishing | 0 | 0 | 0 | 0 | 0 | 4 | 4 |
| | Total | | | 474 | 0 | 0 | 0 | 2 | 367 | 843 |

*The PRTR (Pollutant Release and Transfer Register) Law is a means of obtaining, collating and disclosing emission and transfer volume data for harmful chemical substances.

### Total Volume of PRTR Emission and Transfer



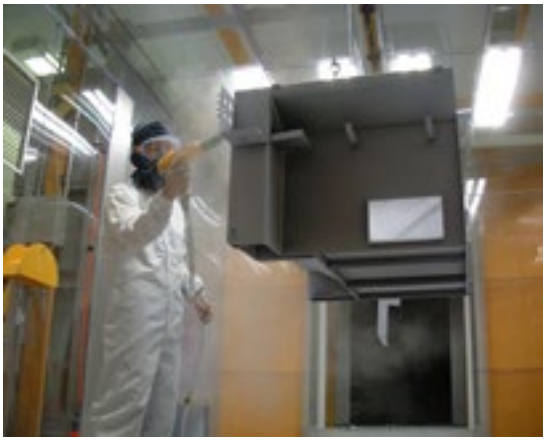
## Measurement result at the time of the on-the-spot inspection conducted in January, 2014

(Unit: mg/ℓ)

| Chemical substance name | Standard value | Measured value |
|---|---|---|
| Zinc | 5 | 0.3 |
| Fluoride and its compounds | 8 | 0.1 |
| Ammonia and its compounds | 100 | Less than 0.7 |

Furthermore, in order to maintain and monitor the standard values above, STAR MICRONICS is implementing weekly voluntary inspections using a simplified measuring method in the Machine Tools Division. Use of the powder coating method allows our company to reduce environmental load at the manufacturing stage.

This new method has realized the environmental effect of cutting atmospheric pollutants (VOC) drastically and reducing industrial waste by one-third.



Powder coating

## Response to EU Environmental Regulations

Environmental regulations in the European Union (EU) have had a significant impact not only within the EU region but also in various countries around the world, and many Japanese manufacturing industries have been forced to respond in some way.

For our products that fall under WEEE and RoHS directives, we are operating based on our internal regulations for management of substances that burden the environment and on green purchasing guidelines.

Also, for REACH Regulations, we are implementing sequential surveys in regards to whether our products include any SVHC, which are added every year.

[Use of X-ray Fluorescence Spectrometers]

We use X-ray fluorescence spectrometers to measure levels of chemical substances contained in components of our printers that fall under the WEEE and RoHS directives, as well as to conduct inspections on receipt of the components.

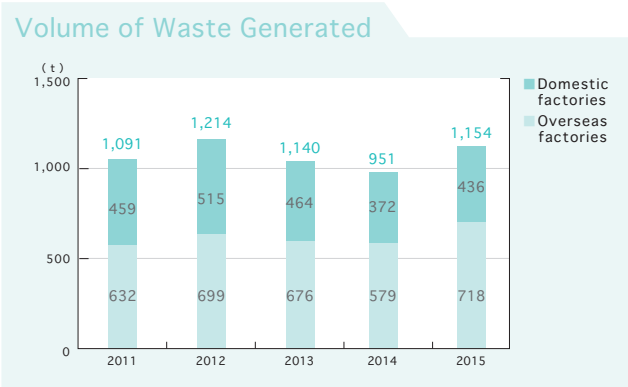
Our machine tools do not fall under these directives, but we have taken aggressive measures such as using X-ray fluorescence spectrometers to measure the composition of components with a view to reducing harmful substances. Components used in the actual machines in our key products are 99% RoHS compliant, excluding certain NC control equipment.

X-ray fluorescence spectrometer

## PROMOTION OF REDUCTION AND RECYCLING ACTIVITY OF WASTE

Star Micronics and its domestic affiliates have created and implemented internal waste management regulations in order to properly dispose of waste produced from corporate activities in line with the requirements of the Waste Disposal Law and to promote voluntary activities.

### Volume of Waste Generated and Recycling Rate




Waste products generated in 2015 decreased by 203 tons compared to the previous fiscal year. This increase was caused by elevated production of machine tools.

The recycling rate was 99.4%. Our company shall continue to instruct group employees regarding the dismantling and separation of trash in order to improve our recycling rate.

## SOCIAL CONTRIBUTION ACTIVITIES RELATED TO THE ENVIRONMENT

### Environmentally Friendly Policies

**Awareness of Earth Environment (from the Star Micronics Group Code of Conduct)**

(1) In our efforts to control $CO_2$ emissions, comply with global warming directives and streamline business efficiency, we will implement business strategies utilizing energy saving equipment to help achieve our goals.

(2) We will guide the establishment of the sustainable economic society with ecological awareness and promotion of environmental activities.

(3) We will guide the realization of the recycling society, trying to utilize all possible resources at all steps from designing to disposal of our products and promoting the environmental load reduction.

(4) We will recognize environmental issues worldwide and engage in them as a global company group.

(5) We will report our environmental protection activities widely and promote the environmental communications with the society.

## Social Contribution Activities

CSR activities at Star Micronics entail an active role in contributing to society with the cooperation of our employees.

### [Participation in voluntary cleanup campaigns in Shizuoka city]

Inviting participation of the employees and their families, STAR MICRONICS participates in voluntary cleanup campaigns organized by the municipal authorities of Shizuoka every year.
In 2014, we organized cleanup campaigns in September.

| Time | Place | Participants |
|---|---|---|
| September 6th(Saturday) | Okitsu River | 21 |

Okitsu River

Our participant

### [China: voluntary activity in Dalian]

In Star Micronics Manufacturing Dalian Co., Ltd., one of the main production bases of the Company overseas located in Dalian, China, we are annually organizing voluntary activities, in which employees give their support to the community.
In 2014, we participated in cleanup activities.

| Date | Place | Participants |
|---|---|---|
| June 7th(Saturday) | Area around factory and Xiaoheishan Mountain forest park | 204 |

Area around factory

Xiaoheishan Mountain forest park

## Publication of the Environmental Report

From the perspective of conserving the environment through such measures as reducing energy usage and saving resources,
Star Micronics does not publish its Environmental Report in paper form. Instead,
the report is published on the Star Micronics website as a PDF-format file.

Environmental activities of Star Micronics・・・http://www.star-m.jp/eng/company/co05.html

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